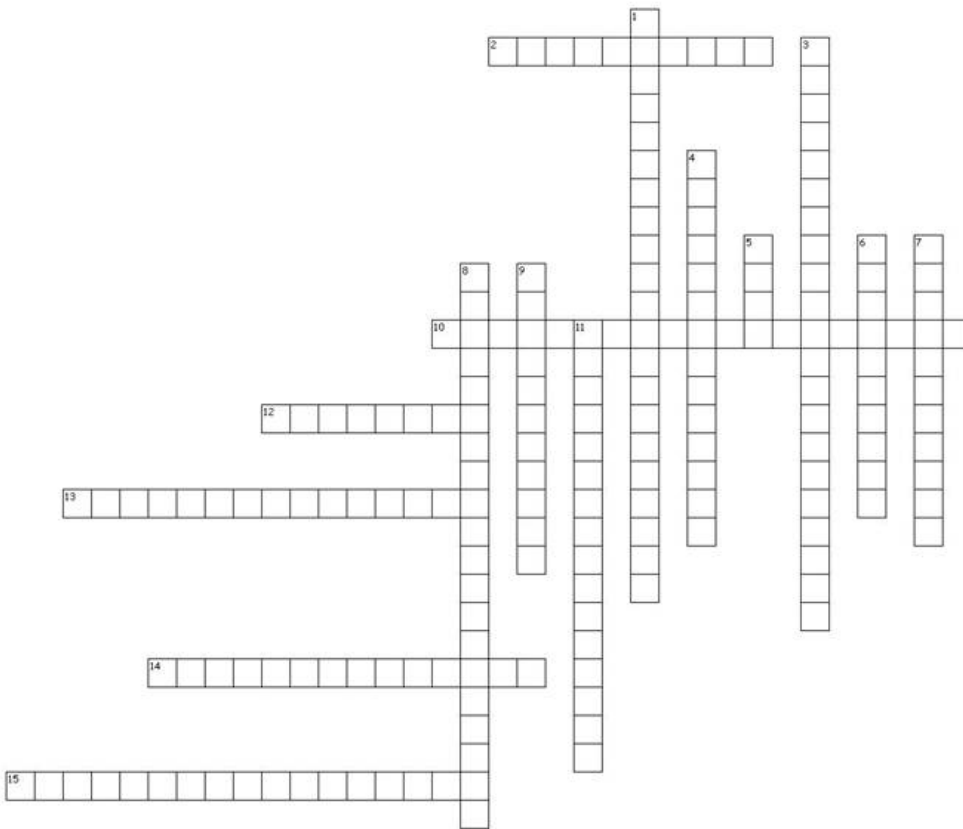


Unit 5b Cellular Respiration and the Mitochondria

Term 3

2011-12



Across

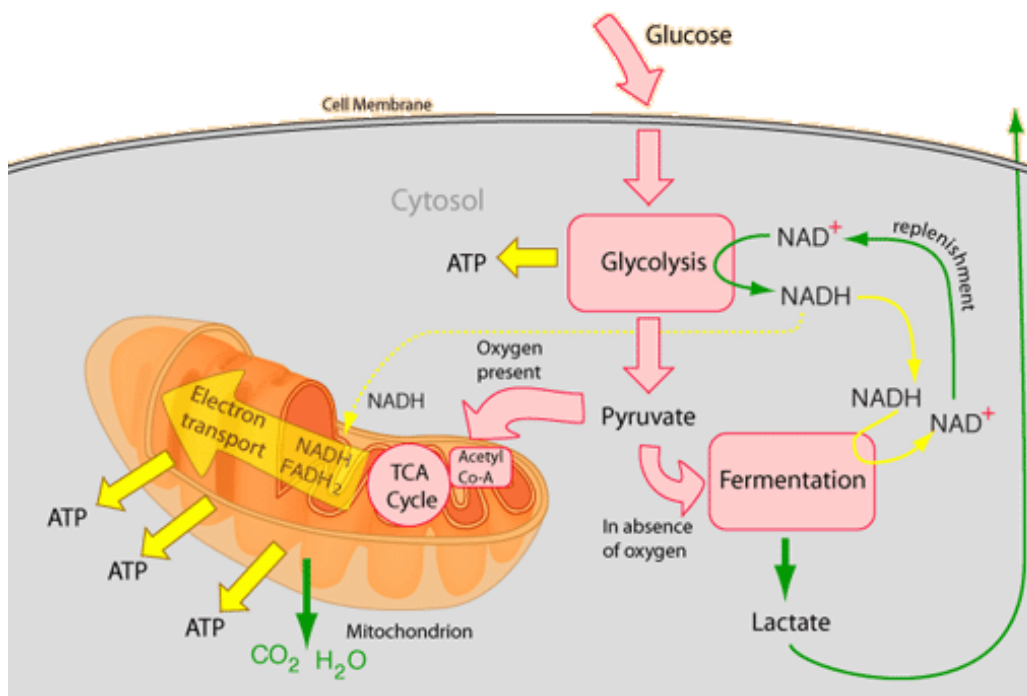
2. In cellular respiration, series of anaerobic chemical reactions in the cytoplasm that break down glucose into pyruvic acid; forms a net profit of two ATP molecules.
 10. Chemical process where mitochondria break down food molecules to produce ATP; the three stages are glycolysis, the citric acid cycle, and the electron transport chain.
 12. Molecules that absorb specific wavelength of sunlight.
 13. In cellular respiration, series of reactions that break down glucose and produce ATP; energizes electron carriers that pass energized electrons on to the electron transport chain.
 14. Process by which autotrophs, such as algae and plants, trap energy from sunlight with chlorophyll and use this energy to convert carbon dioxide and water into simple sugars.
 15. Series of proteins embedded in a membrane along which energized electrons are transported; as electrons are passed from molecule to molecule, energy is released.

Down

1. Anaerobic process where cells convert pyruvic acid into carbon dioxide and ethyl alcohol; carried out by many bacteria and fungi such as yeast.
 3. Energy-storing molecule in cells composed of an adenosine molecule, a ribose sugar and three phosphate groups; energy is stored in the molecules' chemical bonds and can be used quickly and easily by cells.
 4. Phase of photosynthesis where light energy is converted to chemical energy in the form of ATP; results in the splitting of water and the release of oxygen.
 5. Electron carrier molecule; when carrying excited electrons, it becomes NADPH.
 6. Reaction taking place in the thylakoid membranes of a chloroplast during the light-dependent reactions where two molecules of water are split to form oxygen, hydrogen ions, and electrons.
 7. Light-absorbing pigment in plants and some protists that is required for photosynthesis; absorbs most wavelengths of light except green.
 8. Molecule formed from the breaking off of a phosphate group from ATP; results in a large release of energy that is

used for biological reactions.

9. Series of reactions during the light-independent phase of photosynthesis in which simple sugars are formed from carbon dioxide using ATP and hydrogen from the light-dependent reactions.
 11. Phase of photosynthesis where energy from light-dependent reactions is used to produce glucose and additional ATP molecules.



Unit 5b - Cellular Respiration

Chapter 5-1 and 5-3

	<i>Key Vocabulary</i>
1) Students will be able to explain the flow of energy through living systems. a) Compare the metabolism of autotrophs with that of heterotrophs. b) Describe the role of ATP in metabolism. c) Describe how energy is released from ATP.	<ul style="list-style-type: none">• Photosynthesis• Autotroph• Heterotroph• Cellular respiration• Aerobic respiration• Anaerobic respiration
2) Students will be able to demonstrate how glucose is broken down during cellular respiration. a) Summarize how glucose is broken down in the first stage of cellular respiration. b) Describe how ATP is made in the second stage of cellular respiration. c) Identify the role of fermentation in the second stage of cellular respiration. d) Evaluate the importance of oxygen in aerobic respiration.	<ul style="list-style-type: none">• Glycolysis• NADH• Krebs Cycle• FADH₂• Fermentation• Lactic Acid

Test Prep Checklist

Have I completed...

Key Terms...

- ☐ **Completed** and **know** all the Word Parts for this unit and the unit before?
- ☐ **Defined** and **studied** (flash cards help) the Key Terms for the Unit?

Reading Circles...

- ☐ **Completed** each of the reading circles for each of the sections in the book?
- ☐ **Taken** and **corrected** each of the Reading Quizzes for each section in the book?

Must Knows...

- ☐ **Identified** and have **written** the appropriate Must Know on the top of each page in the packet
- ☐ **Studied, Know** and **asked questions** for each of the Must Knows for this Unit.

Notes...

- ☐ **Taken** Cornell Notes for each day of the unit.
- ☐ **Generated** at least 5 questions for each page of notes.
- ☐ **Summary** is written for each page of notes

Organization...

- ☐ Everyday's Must Knows and Homework is written on the calendar or in an assignment notebook.
- ☐ Cornell Notes are stored in binder.

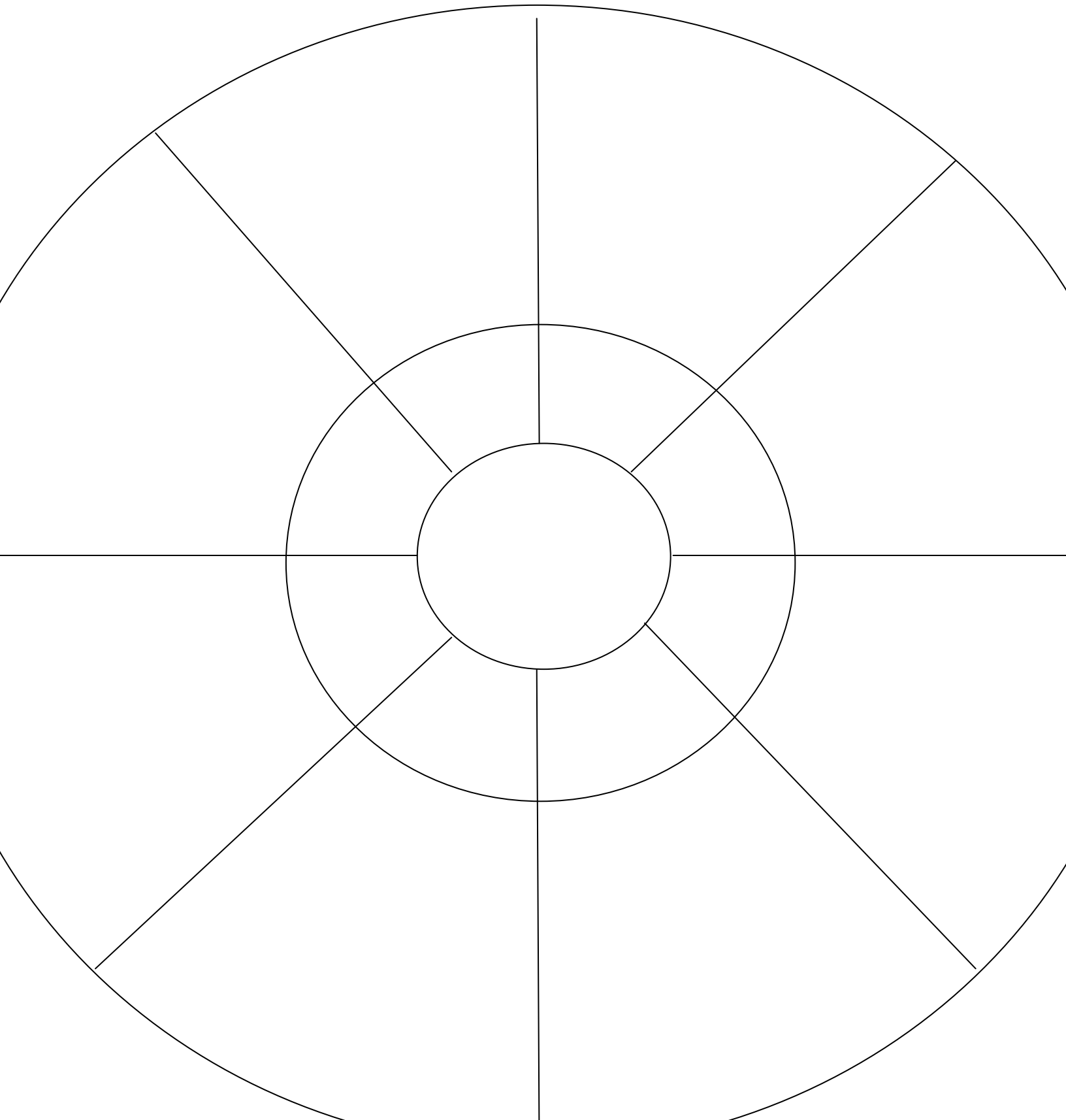
Unit 5b: Cellular Respiration and the Mitochondria

Key Terms

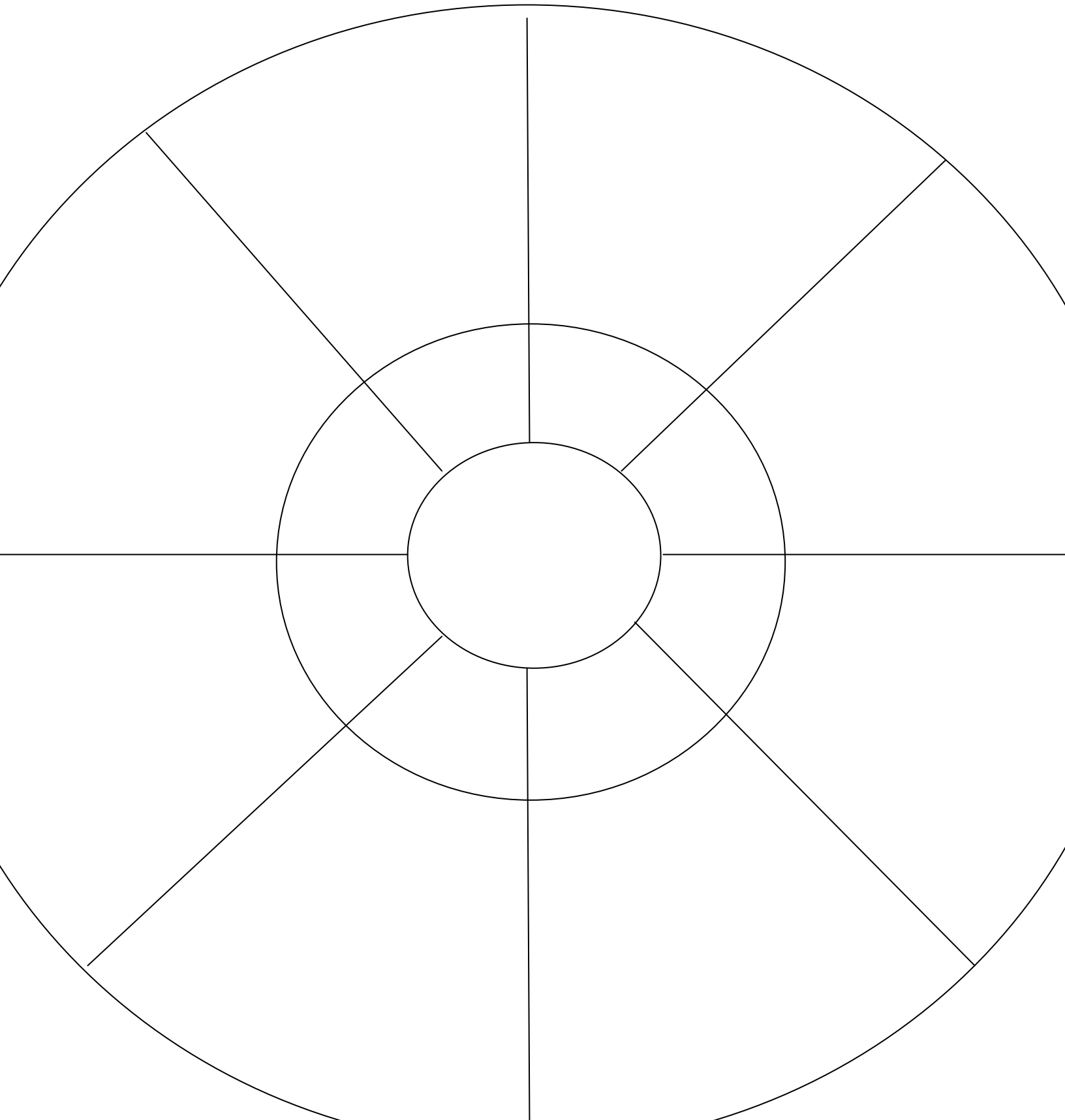
Define the following...

- Photosynthesis
- Autotroph
- Heterotroph
- Cellular respiration
- Aerobic respiration
- Anaerobic respiration
- Glycolysis
- NADH
- Krebs Cycle
- FADH_2
- Fermentation
- Lactic Acid

Must Knows:



Must Knows:



Bell Ringer Worksheet

Question:	Date:
Answer:	

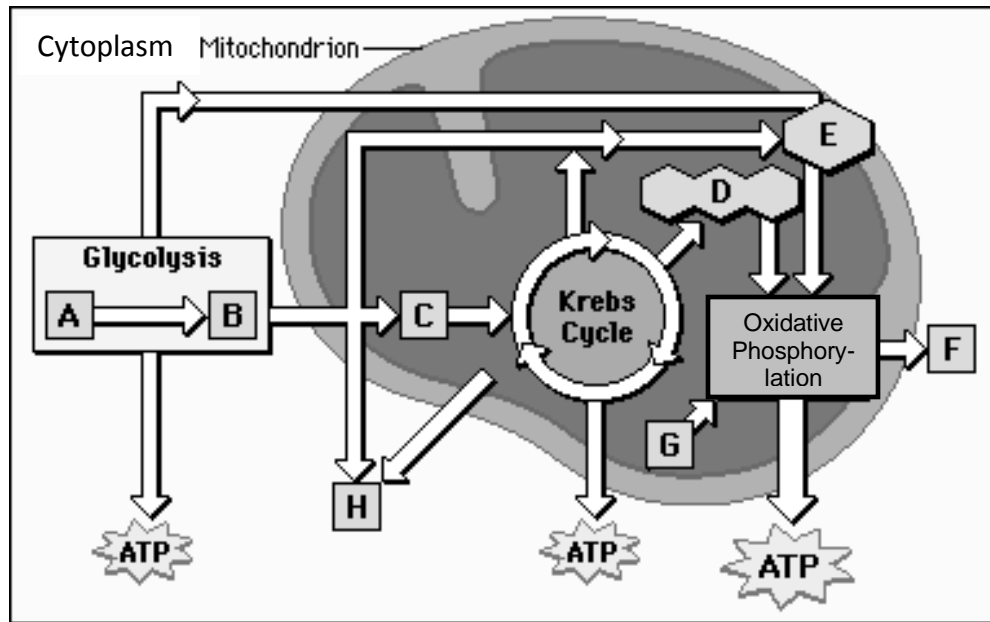
Question:	Date:
Answer:	

Question:	Date:
Answer:	

Question:	Date:
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Question:	Date:
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Question:	Date:
Answer:	



1) Identify the important molecules involved in cellular respiration:

A. _____

B. _____

C. _____

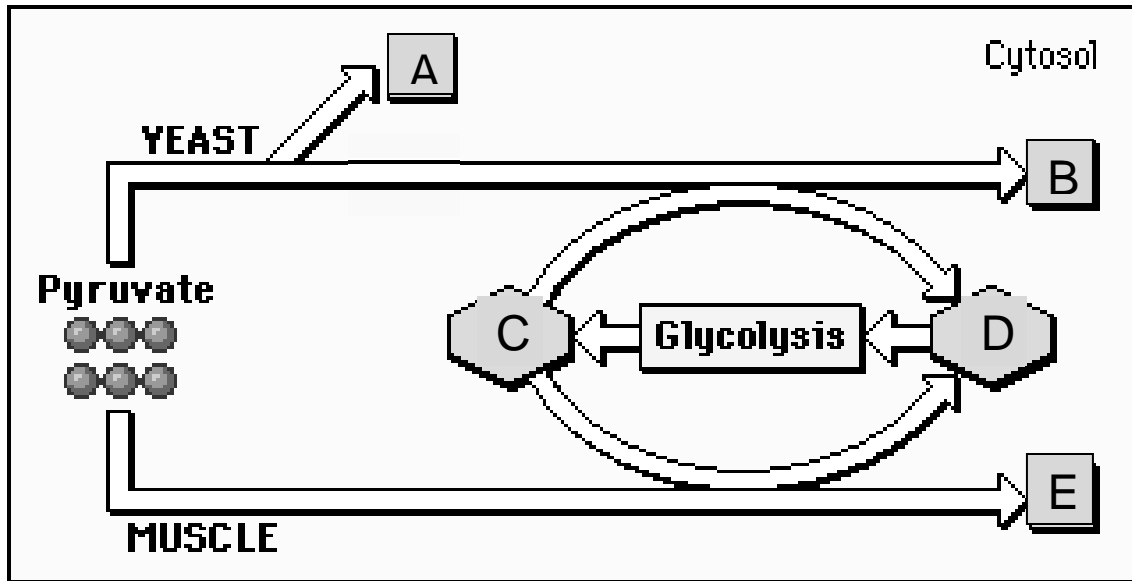
D. _____

E. _____

F. _____

G. _____

H. _____



2) Identify the reactants and products involved in lactic acid and alcohol fermentation.

A. _____

B. _____

C. _____

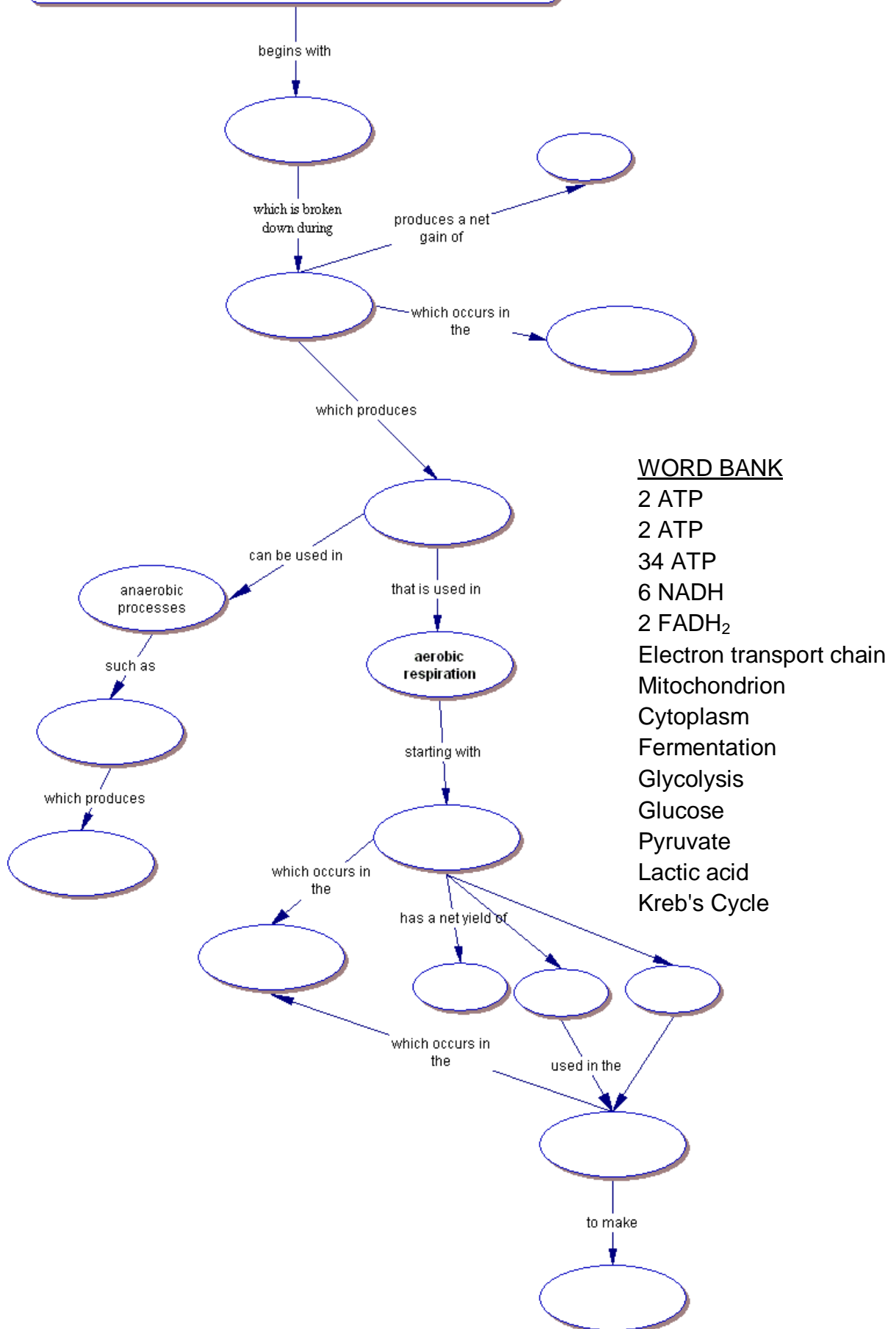
D. _____

E. _____

3) Compare **and** contrast the equation for aerobic respiration with the equation for photosynthesis. (Give similarities and differences between the two equations).

4) Using the words from the word bank, fill in the flow chart on the following page summarizing the major steps of cellular respiration. (Use each word only once)

Cellular Respiration



Skills Worksheet

Test Prep Pretest

In the space provided, write the letter of the term or phrase that best completes each statement or best answers each question.

- _____ ~~1. Photosynthetic organisms get energy from~~
~~a. inorganic substances.~~ ~~c. autotrophs.~~
~~b. light.~~ ~~d. heterotrophs.~~
- _____ 2. Which of the following correctly sequences the flow of energy?
a. bacteria, fungus, rabbit c. sun, grass, rabbit, fox
b. bacteria, sun, flower, deer d. sun, hawk, mouse
- _____ 3. ATP molecules
a. produce NADPH.
b. contain five phosphate groups.
c. can both store energy and provide it for metabolic reactions.
d. help a plant produce carbon dioxide.
- _____ 4. In glycolysis,
a. aerobic processes occur.
b. four ATP molecules are produced.
c. four ADP molecules are produced.
d. glucose is produced.
- _____ ~~5. Which of the following environmental factors does NOT directly influence the rate of photosynthesis?~~
~~a. light intensity~~ ~~c. carbon dioxide concentration~~
~~b. oxygen concentration~~ ~~d. temperature~~
- _____ ~~6. Carbon dioxide fixation in the Calvin cycle requires~~
~~a. ATP and NADPH.~~ ~~c. ADP and NADPH.~~
~~b. ATP and NADP⁺.~~ ~~d. ATP and oxygen.~~
- _____ 7. When this gas is available, aerobic respiration follows glycolysis.
a. carbon dioxide c. hydrogen
b. oxygen d. water vapor

Question 8 refers to the chemical equation below.



- _____ ~~8. This equation summarizes the overall process of~~
~~a. cellular respiration.~~ ~~c. the Calvin cycle.~~
~~b. photosynthesis.~~ ~~d. the Krebs cycle.~~

Test Prep Pretest *continued*

- _____ 9. Which of the following is NOT part of cellular respiration?
- | | |
|-----------------------------|-----------------|
| a. electron transport chain | c. Krebs cycle |
| b. glycolysis | d. Calvin cycle |

- ~~_____ 10. Electrons in pigment molecules become excited~~
- | |
|---|
| a. when light strikes a thylakoid. |
| b. when water molecules are broken down. |
| c. during light-independent reactions. |
| d. during the Calvin cycle. |

Complete each statement by writing the correct term or phrase in the space provided.

- ~~11. The carrier protein that transports hydrogen ions across thylakoid membranes and produce ATP acts as both a(n) _____ and a(n) _____.~~
12. The _____ is the most common method of carbon dioxide fixation.
13. Aerobic respiration occurs in the _____ of eukaryotic cells.
- ~~14. Plants use sugars produced during _____ to make organic compounds.~~
- ~~15. During photosynthesis, light energy is converted to _____ energy.~~
16. During anaerobic processes, NADH transfers electrons to the pyruvate produced during _____.
17. Glycolysis is a biochemical pathway that breaks down a six-carbon glucose molecule to two three-carbon _____.
18. During aerobic respiration, pyruvate is first converted to acetyl-CoA, which enters the _____.
19. During cellular respiration, a cell produces most of its energy through _____ respiration.

Test Prep Pretest *continued*

~~20. Light absorbing _____ are located in the membranes of _____ .~~

Read each question, and write your answer in the space provided.

21. Explain how the metabolism of heterotrophs differs from that of autotrophs.

22. Explain how ATP provides energy for cells.

~~23. Briefly explain how ATP is produced by electron transport chains during photosynthesis.~~

Test Prep Pretest *continued*

~~**24.** Describe how environmental factors affect the rate of photosynthesis.~~

~~**25.** Explain the benefits and uses of lactic acid fermentation and alcoholic fermentation.~~
